Amendments to the Claims:

1. (original) A method for signal conditioning in an electronic sensor having a sensing element, the sensing element generating a first signal and a second signal, the method comprising the steps of:

receiving the first signal from the sensing element, the first signal having a frequency at an event;

sampling the second signal from the sensing element based on the frequency of the event, the second signal having a plurality of components, one of the plurality of components being a first component of interest;

generating a synchronized second signal in a time domain, the second signal having the plurality of components;

generating complex data in a frequency domain from the synchronized second signal in the time domain;

determining the first component of interest from the complex data; and

normalizing the first component of interest using amplitude information from the first signal.

2. (original) The method of claim 1, further comprising the steps of:

driving the sensor element with a drive signal, and

injecting a first test signal into the drive signal.

3. (original) The method of claim 2, wherein the first test signal has a frequency that is independent of the drive signal.

4. (original) The method of claim 2, wherein the first test signal of the injecting step provides a variation in the first component of interest of the sensor, and further comprising the steps of:

detecting the first test signal in a first feedback signal from the sensing element;

indicating a fault if the first test signal in the first feedback signal does not substantial match the first test signal from the injecting step; and

subtracting the first test signal from the first component of interest.

5. (original) The method of claim 4, wherein the injecting and detecting steps are performed continuously during the operation of the sensor.

6. (original) The method of claim 2, further comprising the steps of:

injecting a second test signal on a quadrature bias reference of the drive signal;

detecting the second test signal in a second feedback signal from the sensing element; and

indicating a fault if the second feedback signal in the second feedback signal does not substantial match the second test signal from the injecting step.

7. (original) The method of claim 6, wherein the second test signal is injected in a bias control of the sensor element and the second test signal has a frequency that is independent of a quadrature frequency.

8. (original) The method of claim 2 wherein the first test signal is injected into an amplitude reference of the sensor element.

9. (original) A method for conditioning an angular rate signal in a gyroscope sensor having a sensing element with a pair of proof masses, the method comprising the steps of:

receiving a first signal from the sensing element, the first signal representative of a first movement of the proof masses in a first plane;

receiving a second signal from the sensing element, the second signal representative of a second movement of the proof masses in a second plane;

sampling the second signal from the sensing element based on the frequency of the first signal;

generating a synchronized second signal in a time domain, the synchronized second signal including a plurality of components, one of the plurality of components being the angular rate;

generating complex data in a frequency domain from the synchronized second signal in the time domain, the complex data including the plurality of components;

determining the angular rate from the complex data; and

normalizing the first angular rate using amplitude information from the first signal.

10. (original) The method of claim 9, further comprising the steps of:

driving the sensor element with a drive signal, and

injecting a first test signal into the drive signal, the first test signal having a frequency that is independent of the drive signal.

11. (original) The method of claim 10, wherein the first test signal of the injecting step provides a variation in the first component of interest of the sensor, and further comprising the steps of:

detecting the first test signal in a first feedback signal from the sensing element;

indicating a fault if the first test signal in the first feedback signal does not substantial match the first test signal from the injecting step; and

subtracting the first test signal from the first component of interest.

12. (original) The method of claim 11, wherein the injecting and detecting steps are performed continuously during the operation of the sensor.

13. (original) The method of claim 9, further comprising the steps of:

driving the sensor element with a drive signal;

injecting a first test signal on an amplitude reference of the drive signal and a second test signal on a bias reference of the drive signal;

detecting the first test signal in a first feedback signal from the sensing element and the second test signal in a second feedback signal from the sensing element; and

indicating a fault if one or more of the first feedback signal in the first feedback signal does not substantial match the first test signal from the injecting step and the second feedback signal in the second feedback signal does not substantial match the second test signal from the injecting step.

14. (original) A signal conditioning system in an electronic sensor, the system comprising:

a sensor element that reports a first signal and a second signal, the first signal having a frequency at an event;

a phase locked loop for receiving the first signal and determining the frequency of the event;

a signal sampler for receiving the second signal and generating a synchronized second signal in a time domain, the signal sampler capable of sampling the second signal based on the frequency of the event determined by the phase locked loop;

a spectrum analyzer for receiving the synchronized second signal in the time domain and generating complex data in a frequency domain;

a decoder for receiving the complex data in the frequency domain and generating a first component of interest, the first component of interest being a component of the complex data in the frequency domain;

a drive signal for driving the sensor element; and

a scaling unit that divides the first component of interest by a measured value of the oscillator amplitude to normalize the first component of interest.

15. (original) The system of claim 14, the electronic sensor is a gyroscope, the sensor element having at least a pair of movable proof masses, the first signal and second signal being indicative of oscillatory movement of the proof masses, and the first component of interest being an angular rate of the sensing element.

16. (original) The system of claim 15, further comprising:

a first test signal injected into the drive signal and having a frequency that is independent of the drive signal; and

a first feedback signal from the sensor element.

17. (original) The method of claim 16, wherein the first test signal provides a variation in the angular rate of the sensor, and further comprising a failure detector that detects the first test signal in a first feedback signal from the sensing element and indicates a fault if the first test signal in the first feedback signal does not substantial match the first test signal, and wherein the scaling element subtracts the first test signal from the angular rate.

18. (original) The system of claim 15, wherein the first test signal is injected continuously and the failure detector operates continuously during the operation of the sensor.

19. (original) The system of claim 15, further comprising:

a first test signal and a second test signal injected into the drive signal with each test signal having a frequency that is independent of the drive signal;

a first feedback signal and a second feedback signal from the sensor element;

a failure detector that compares the first and second test signals in the respective first and second feedback signals with the respective injected first and second test signals, wherein the failure detector indicates a fault if one or more of the first feedback signal in the first feedback signal does not substantial match the first test signal and the second feedback signal in the second feedback signal does not substantial match the second test signal.

20. (original) The system of claim 19, wherein the first test signal is injected on an amplitude reference of the drive signal and a second test signal is injected on a bias reference of the drive signal.